CSC311 Computer Algorithms

Third Semester 1444

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Tutorial #1

1. Given the matrices A and B of sizes m x l and l x n respectively.

    a) Write the pseudocode to compute the matrix C = A x B
    b) What is the complexity of the code that you wrote?

2. Consider the following code fragment,

    x ←1
    for i ← 1 ..n step 3 do
    x ← x +2
    print x

    What value of x will be printed (express it as a function of n)

3. Consider the following code fragment,

    x ←5
    i ← 1
    While (2 i < N) do
    i ← i +2;
    x ← x +3;

    print x

    What value of x will be printed (express it as a function of N)

4. Show that $6n + 3n \log(n^5) = O(n \log n)$. Find the appropriate values of C and n_0 .

5. Show that $2n^3 - 10n^2 + 2 = O(n^3)$. Find the appropriate values of C and n_0.

6. Prove or disprove the statement, $2^{n+2} = O(n^2)$.

7. Prove that $3^n = O(n!)$. Find the appropriate values of C and n_0.

8. Compare the order of growth for 3^{2n} and 5^n.